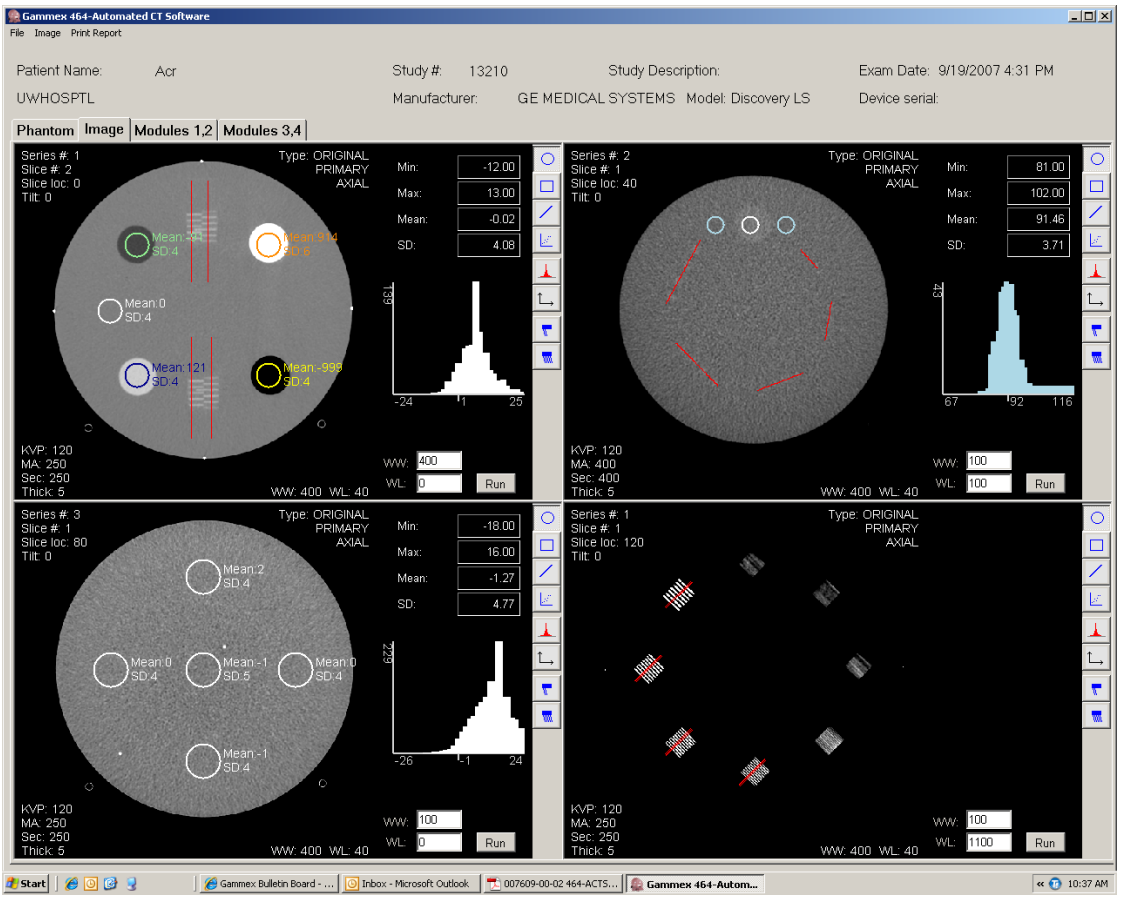
DIAGNOSTIC RADIOLOGY

464 – Automated CT Software (ACTS) v1.2 32-Bit



User's Guide

Gammex

DIAGNOSTIC RADIOLOGY

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1. Introduction

Dear Customer,

Thank you for purchasing Gammex 464 Automated CT Software. Best results can be obtained by following this manual. Operation of this application for other than its intended purpose is a violation of the Gammex Product Warranty and may cause erroneous results.

PRODUCT DESCRIPTION

464-Automated CT Software (ACTS) is a software program designed for evaluating CT image systems. These instructions describe how to use the software.

INTENDED USE

The software is intended to be used for quality control of CT image systems. Use of the Gammex 464-Automated CT Software (ACTS) in any manner other than its intended use is carried out entirely at the user's risk.

OVERVIEW

The main screen contains three tab pages: '*phantom*' tab displays patient list, file names and current image panel. '*image*' tab displays four image panels side by side. Each image panel has its own region of interest (ROI) selection, histogram display and window leveling tool. '*report*' tab contains four report panels that draw measurement result curves corresponding to the image panels.

IMPORTANT NOTES

The PHANTOM tab displays the input images to be analyzed (upper portion of black section of tab), another section with four empty quadrants (for modules 1,2,3,and 4) into which the input data are to be "clicked and dragged as inputs," (lower left of black background section of tab), and another area showing a template illustrating proper positioning of each of the four modules in the correct quadrants (modules 1,2,3,4) (lower right section of black background tab).

The (lower right) template is provided so that the user knows which image is to be clicked, dragged, and dropped into each of the four input quadrants (lower left). Correct analysis relies upon correct placement of the input images into the proper quadrants.

If images are placed into the wrong quadrants, proper analysis (results) cannot be expected.

464-ACTS has the ability to read three types of DICOM image file names:

1) image filename **.dcm**
2) image filename **.img**
3) image filename **(no extension)**

Note: 464-ACTS can read just one of the above three formats per study directory (ensure all image files within a single study directory are of the same naming format.)

Installing this software on a Microsoft Windows platform requires the user to be logged in with Windows Administrator privileges.

1. Introduction (continued)

DOCUMENT SYMBOLS

The following document conventions are used throughout the Software and Calibration Guide.

<Angled Brackets>	Indicates the names of the keys on the PC keyboard. <ENTER> or <Clear>
“Quotations”	Indicates a reference to on-screen messages or status information that appear throughout the program. For example: “QCTestResults.txt…”
Bold	Indicates a screen name or menu option. For example: **File or Database**
Italics	Indicates a reference to another section in the Image Analysis Software Guide or other documentation. For example: *Please refer to the Trouble Shooting section.*

Note:	**Note boxes call attention to important information regarding the software.**

1. Introduction (continued)

MINIMUM COMPUTER REQUIREMENTS

Operating System: Microsoft Windows XP 32-bit, service pack 2 or 3. Clean Install

Intel Pentium-based 1 GHz microprocessor

1 GB free hard drive space

1 GB RAM

CD-ROM Drive

32-bit Color

1280 X 1024 display resolution

About monitor aspect ratio: 464-ACTS will display proper proportion to images when run using the same display resolution aspect ratio (standard or widescreen) supported by your hardware platform. However running 464-ACTS on non-native screen aspect ratio (for example selecting a standard aspect display resolution on a widescreen monitor) will distort 464-ACTS images and make circular slice images look like ovals, etc. Be sure to select a display resolution aspect ratio common with the hardware you are using. Standard aspect ratio (width divided by height) = 1.25. Widescreen aspect ratio (width divided by height) = 1.6

SYSTEM CHECKS

Before installing or running 464-ACTS, perform these system checks:

Operating System

Make sure that the operating system, such as Windows XP, service pack 2 or 3 is installed and running/functioning properly on the PC.

Memory

Check to ensure at least 1 GB of RAM is installed on the PC (as shown on the self-diagnostic RAM test during system boot).

Screen Savers

Use only Windows preloaded screen savers. Other screen savers may interfere with 464-ACTS.

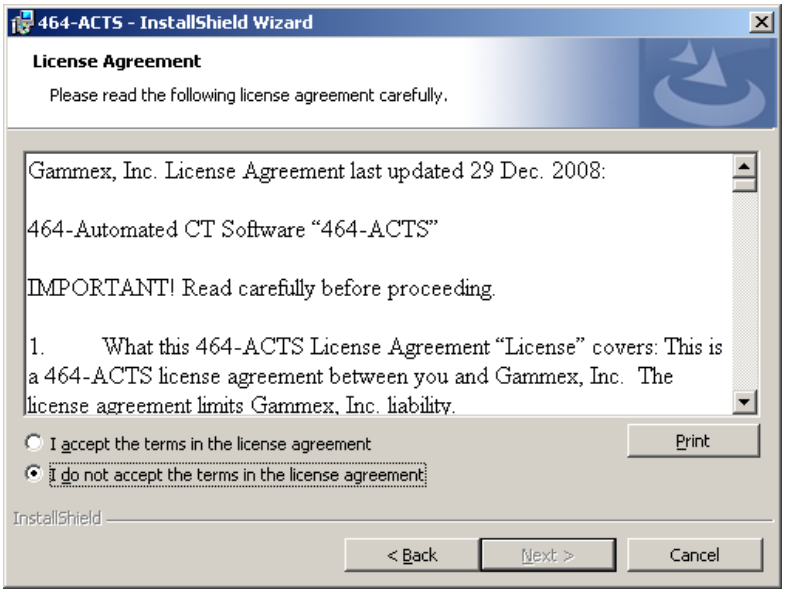
2. Installing the Software

Note: To install the software, you must be logged in as Administrator with Administrator privileges on your computer.

1. Be ready to install the software before you insert the CD as the software will begin to install automatically as soon as the CD is inserted. If you wish to cancel installation, double-click the X in the upper right corner of the black install screen. There will be several opportunities to back out during the installation process.

Note: If auto-install fails to run (Windows XP), it may be because your computer has auto-run disabled. To check this, open the Windows Explorer (or my computer). Find the DVD/CD and right click on it. Choose Properties. Choose the "AutoPlay" tab from which you can ensure AutoPlay is configured to automatically run the installer application. Then re-boot the computer, re-insert the installation disc and try again.

2. Please carefully read the license agreement and click the 'I accept the terms in the license agreement' to continue. Clicking the 'I do not accept the terms in the license agreement' will discontinue installation.


464-ACTS - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
Gammex, Inc. License Agreement last updated 29 Dec. 2008:
464-Automated CT Software "464-ACTS"
IMPORTANT! Read carefully before proceeding.
1. What this 464-ACTS License Agreement "License" covers: This is a 464-ACTS license agreement between you and Gammex, Inc. The license agreement limits Gammex, Inc. liability.
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
InstallShield
< Back
Next >
Cancel

3. Follow the instructions. At the beginning you may be asked (depending which library versions, if any, already exist on your computer) to install the Microsoft Visual Studio Runtime Library, which is required to run this software.

4.The installation program will continue to install 464-Automated CT Software. Click "Next" and accept the defaults.

5. If the text installer screen does not appear automatically, manual operation may be accomplished: click on the Windows Start button on the task bar, and then select Run.

6. Enter D:/Autorun.bat (where D: is your CD-ROM's drive letter) in the Run dialog box and click the <OK> button.

NOTE: Drive letter D: is assumed in this example. If a different letter is designated as your CD-ROM name, then use that drive letter.

7. The text installer screen should appear, and installation will proceed automatically. To exit the installation at any time, double click the X in the upper right corner of the black install screen.

8. When you are asked to select a destination directory you may enter a manual choice, but the default directory is recommended. If you would like to select a different directory, click the <Browse> button and choose a directory to install. Click the <Next> button to continue.

9. The Installer is now ready to complete the installation. Click the <Next> button to continue.

10. After the software has been successfully installed you may launch the program from the Windows Desktop or from the <Start> button.

This completes the 464-Automated CT Software (ACTS) installation on your PC.

3. Getting started

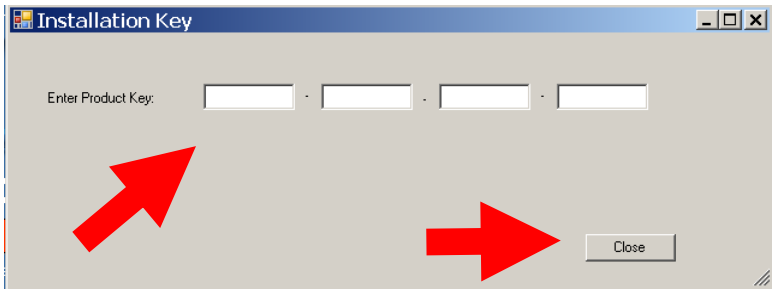
A note about getting the 464 phantom images:

> Section 4 of the American College of Radiology (ACR) instructions give very detailed directions for setting up the 464 phantom and aligning it to obtain 'proper' images. The instructions must be followed carefully.

Running 464-ACTS to analyze the 464 images.

1. When you run the 464-ACTS program for the first time, a window may pop up asking for your product key. Locate your product key on the letter which came in the envelope with your CD.

2. Type in the sixteen-digit product key code without any spaces or dashes. The pop-up window will automatically shift right to place the digits into the boxes in groups of four.



3. When you have typed in all sixteen digits, click the "Close" button.

4. Then double-click the “464-ACTS” desktop short-cut to start the application. You will now see the main screen (see next page)

Importing DICOM images for use with 464 ACTS software

The QC Image list is stored on your computer hard drive at C:\DICOMDIR\Phantom List\... Images to be analyzed must first be stored into C:\DICOMDIR\Phantom List\... (and then start 464-ACTS after they’re placed in that path) to enable them to show up in this main screen file structure area (for use within 464-ACTS).

The 464-ACTS application can import and display a maximum of 15 images from each (C:\DICOMDIR\Phantom List \ …) study folder. Where more images are needed, divide and group them into folders such that each study folder contains no more than 15 images.

Quick Start

<u>Step I – Create the file where the imported images will be stored for use by the 464 ACTS software.</u>

1. If the computer that is running the 464 ACTS software is already connected to a network that includes the address of the target images, go to step 3.

2. Connect the computer that is running the 464 ACTS software via USB or serial cable to the computer where the DICOM images are stored.

   Or

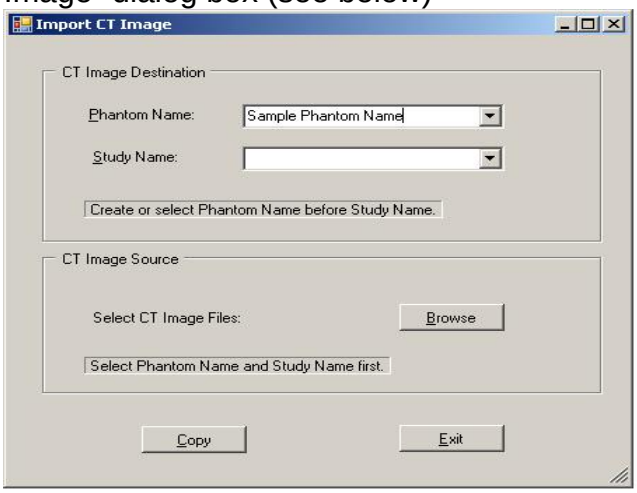
   Insert the digital media containing the DICOM images into the computer running the 464 ACTS software.

3. Launch the 464 ACTS software

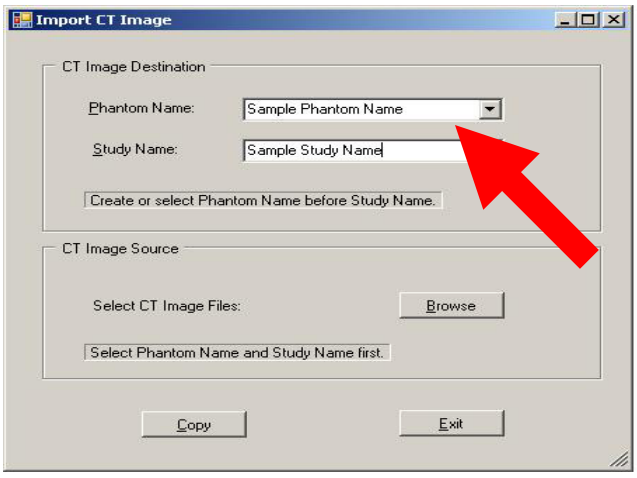
4. Click on “File” then “Import CT Image” (Pull-Down Menu)

5. The Import CT Image dialog box (shown below) consists of two sections: an upper CT Image Destination section used to specify the path to which the CT Image files will be written and a lower-middle CT Image Source section used to specify the path from which the CT Image files will be obtained. In addition (at the bottom of the dialog box), there are two “operator” buttons “Copy” or “Exit.” “Copy” proceeds with the specified file import. “Exit” returns you to the prior main screen.

From the main screen File-Import CT Image pull-down menu you can open the “Import CT Image” dialog box (see below)



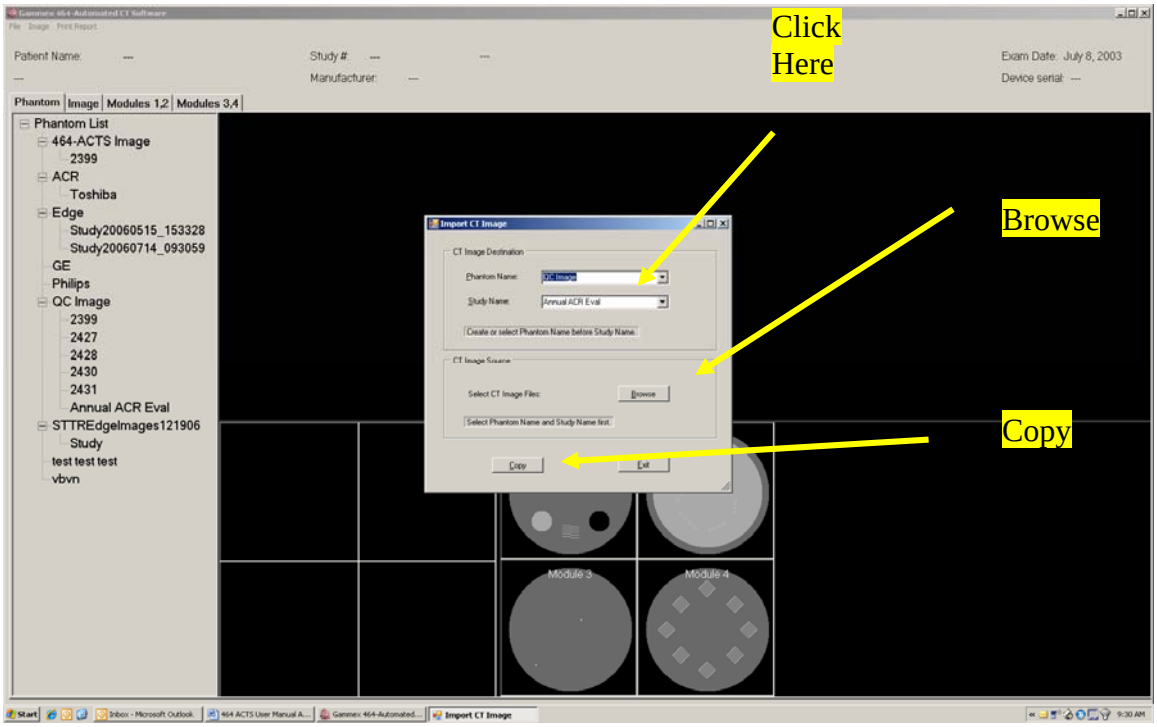
Then using your mouse, click on the white area immediately to the right of the text you just typed (but left of the drop-down arrow within same row). This “click on white area” is used to tell the computer you are done typing and verifying spelling, so the computer should accept the newly input field you entered.



6. Repeat the process for a “New Study Name”. The “Study Name” uniquely identifies the test. This could be the study number assigned by the scanner or the date of the test, for example.

Step II – Locate and import the target DICOM images.

- Click on “Browse” button and navigate to the images to be imported.
- Hi-light those images (maximum 15 images per study name)
- Click “Copy”



ADDING FOLDERS (Phantom names) or SUBFOLDERS (Study names) to the C:/DICOMDIR/Phantom List/… file structure

New folders and study names (sub-folders) to the directory structure can be added in two ways. One way is to use the Import CT Image dialog box which is accessed from the 464-ACTS pull-down menu: File – Import CT Image. (as described in the “Quick Start” Section)

The other way is to simply use the Microsoft Windows Explore application to manually create the file structure and add the DICOM image files. In Windows XP, right-click the “Start” button, left-click (select) “Explore” and then create or modify your file structure with DICOM images organized/arranged in accordance with your needs/preference.

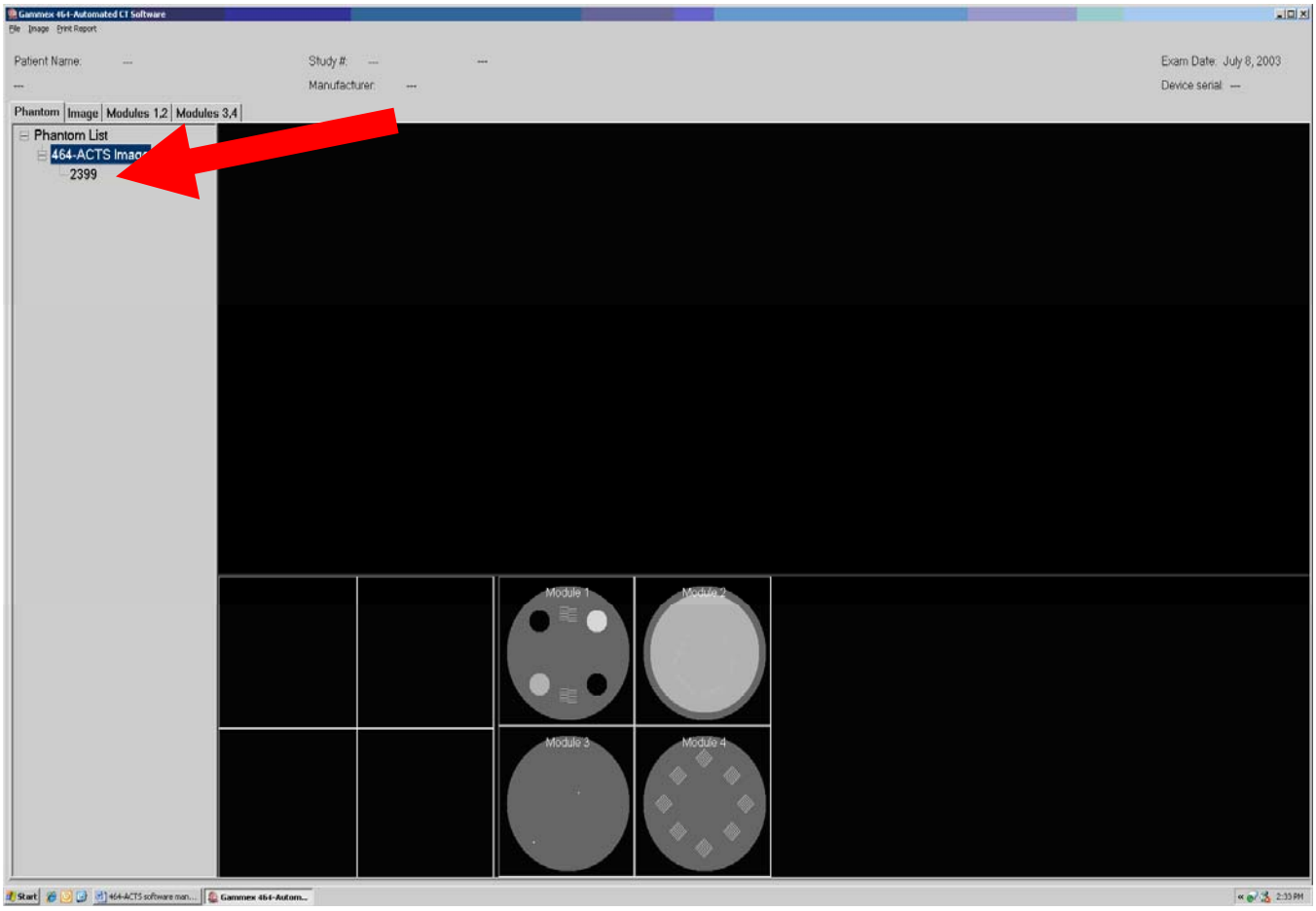
4. Image Analysis

Main Screen

The main screen contains four tabs. The '*Phantom'* tab displays the phantom list, the file names and the current image panel. The *'Image'* tab displays four image panels side by side. The *'Modules 1, 2'* tab contains the results for module 1 (alignment test, slice thickness, and CT number test) and module 2 (low contrast resolution). The *'Modules 3, 4'* tab has test results for CT module 3 (CT number uniformity test) and module 4 (high contrast resolution test).

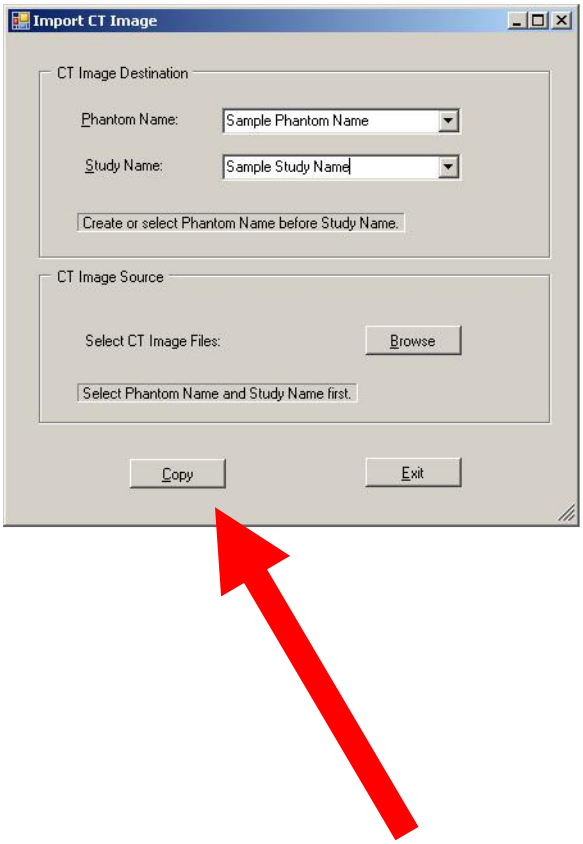
To get images set up to run the tests, select the desired phantom scan images from the file structure by clicking on the desired source image file structure location (example: \464-ACTS Image\2399) along the left (gray) side of the '*Phantom'* tab (expanded file structure along the left-side vertical grey section) of the main screen: phantom tab (see below).

Main Screen: Phantom tab



Choose the set of images that you wish to analyze by clicking on the corresponding **study / file** name (**464-ACTS Images: 2399** in the above screen-shot example).

Next, type the new study name "Sample Study Name" into the appropriate input box. Then using your mouse, click on the white area immediately to the right of the text you just typed (but left of the drop-down arrow within same row). This "click on white area" is used to tell the computer you are done typing and verifying spelling, so please accept the newly input field you entered.



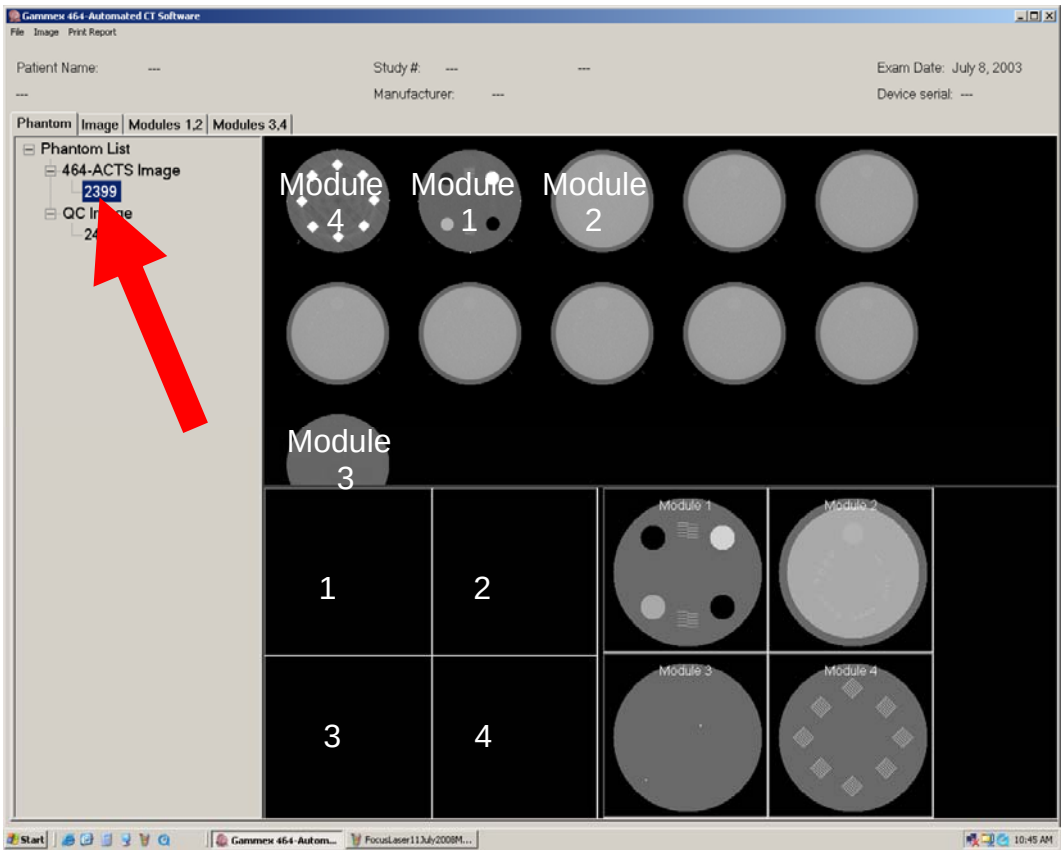
To import the selected CT images (after having specified both CT Image Destination and CT Image Source), press the “Copy” operator button which will return a small confirmatory box specifying the number of files successfully imported or telling you that no such .DCM files were imported in the CT Image Source path you specified/input.

When you are finished, then select the “Exit” operator button in the bottom right section of the Import CT Image dialog box.

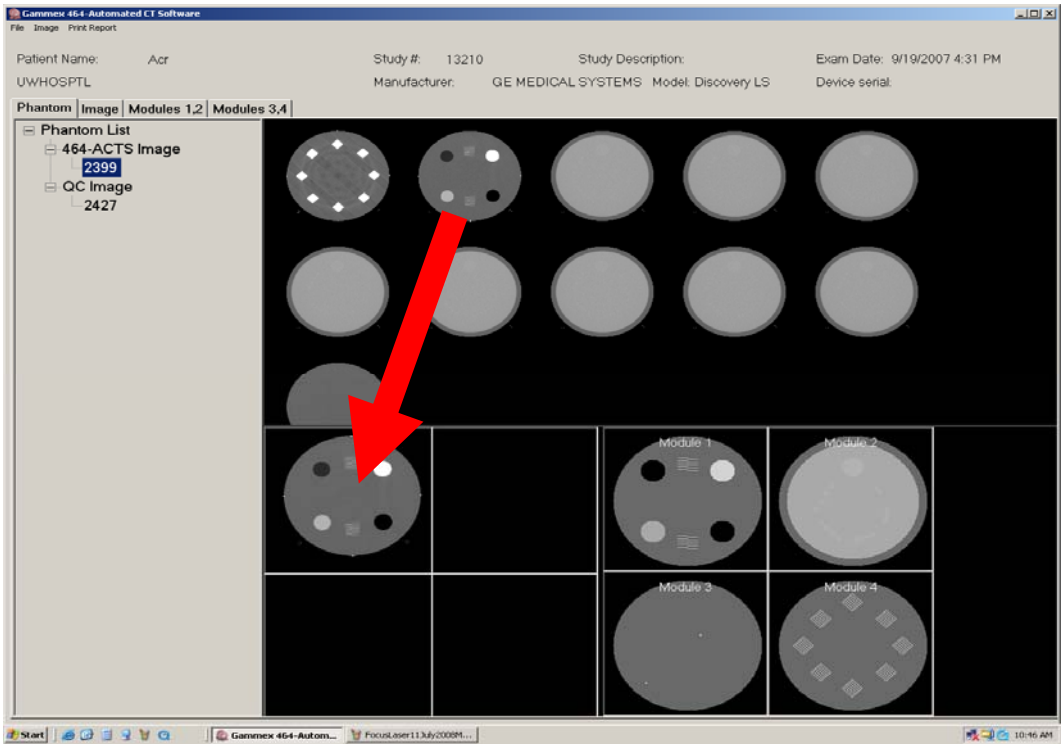
The alternate way to add new folders and study names to the directory structure is to use the Windows explorer to manually create, remove, and manipulate the folders and their contents.

Note: Once new Phantom Names and/or Study Names are added to the directory structure, they can be removed by using the Windows explorer (manually). The path to these folders is C:\DICOMDIR\Phantom List\ … To remove study folders and their contents, open Windows explorer and navigate to the desired folder(s) and then right click on the folder to access the menu of options (delete, for example).. then left click the desired operation.

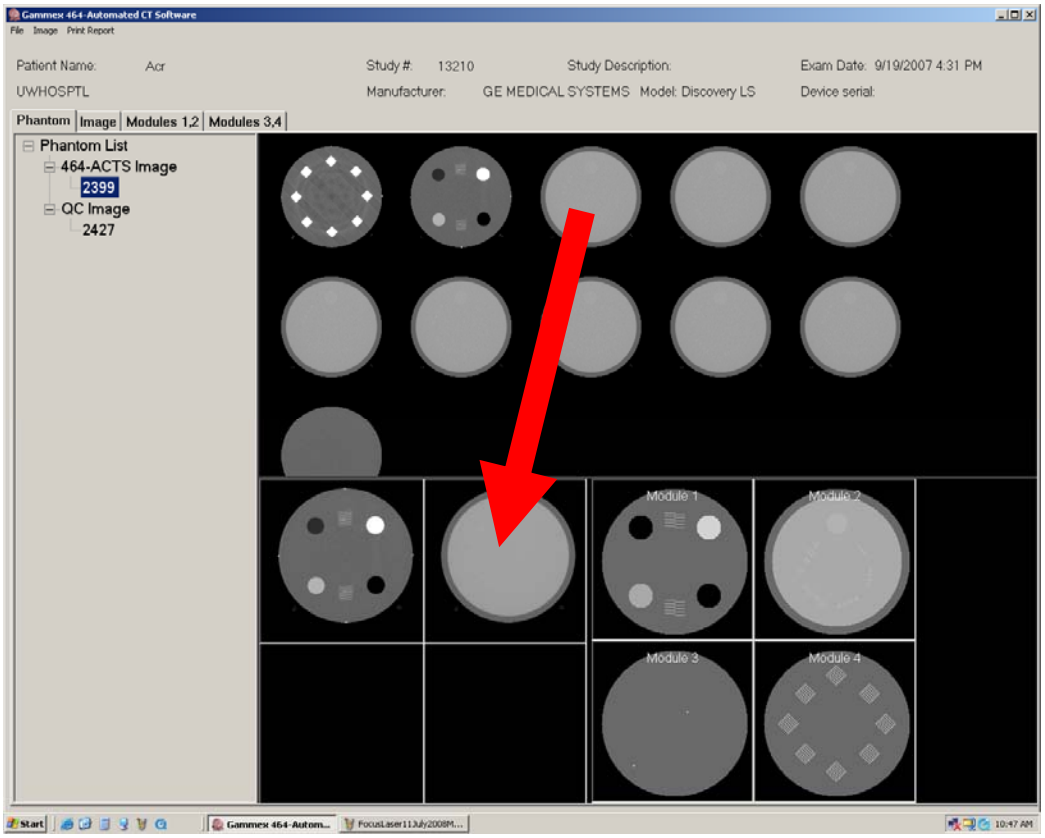
The selected (2399) images are displayed on the (upper) black area of the "Phantom" tab:

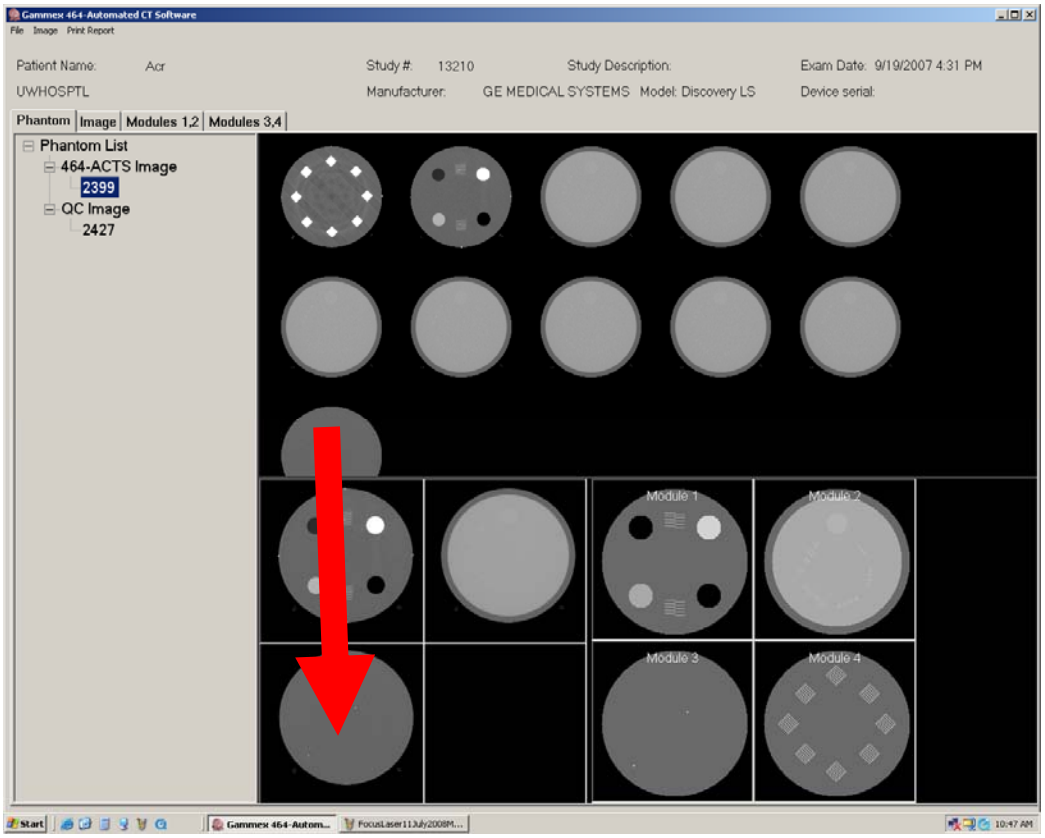


Click (hold), drag, and drop each of the four images from the upper section of the black screen into the correct box (left side of black screen) as shown by the template (lower - right portion of screen).



Note any one of the multiple Module 2 images from the upper main screen section may be placed into the Module 2 input area for analysis (one-at-a-time).





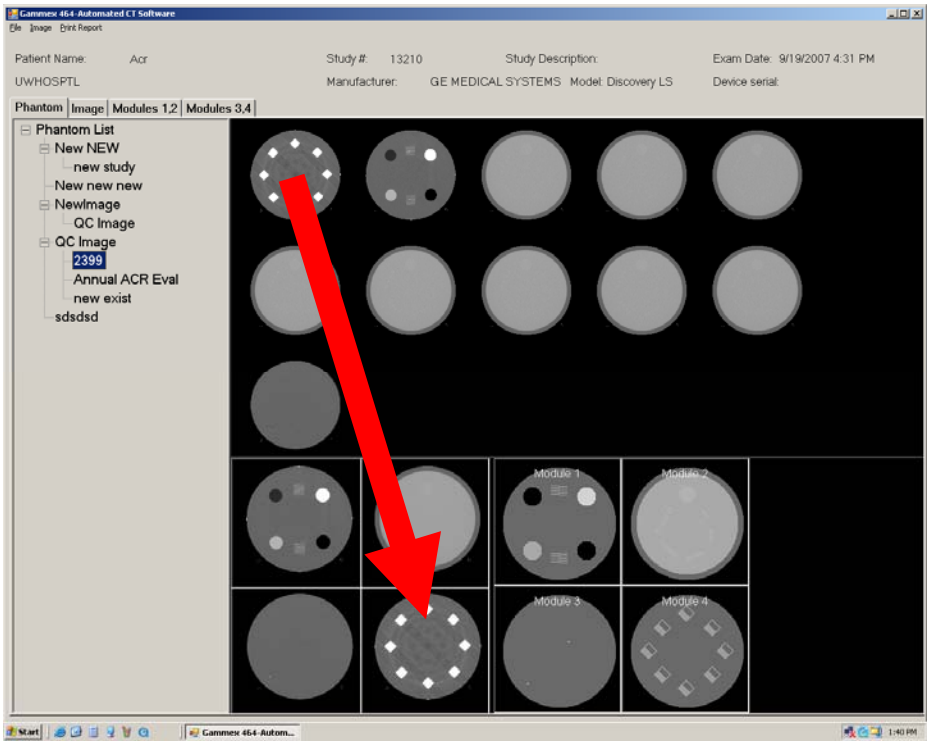
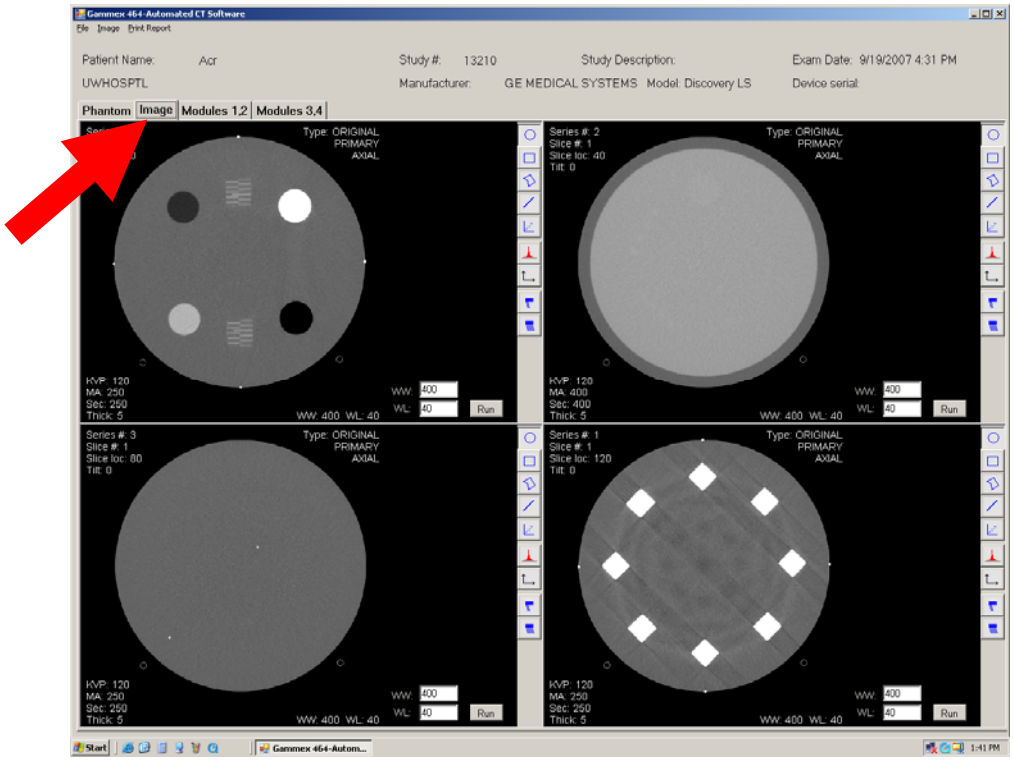


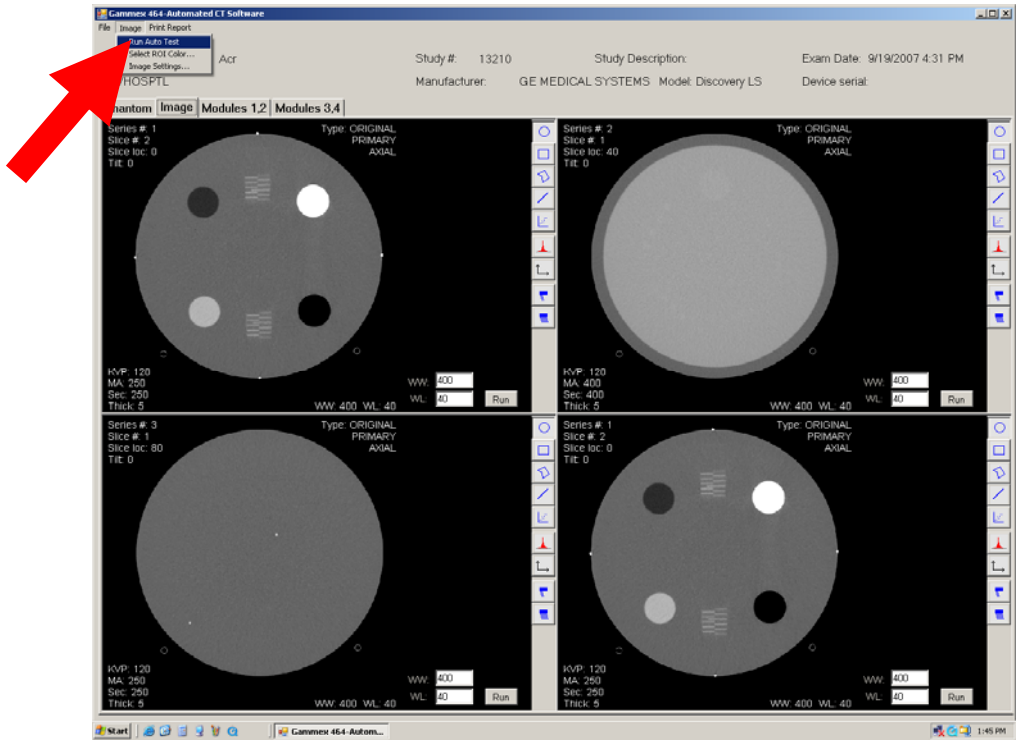
Image Screen

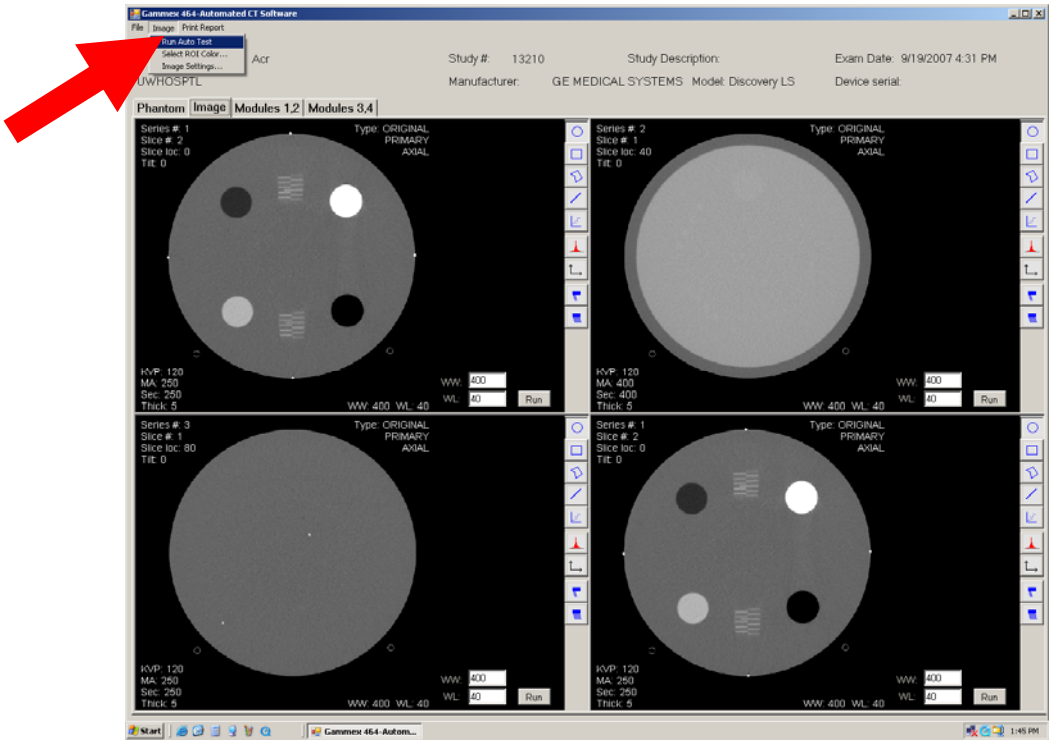
When all four boxes have been filled, click on the "Image" tab which will display the four selected images across the whole screen.



Click on the "Image" menu word to select the drop down menu.

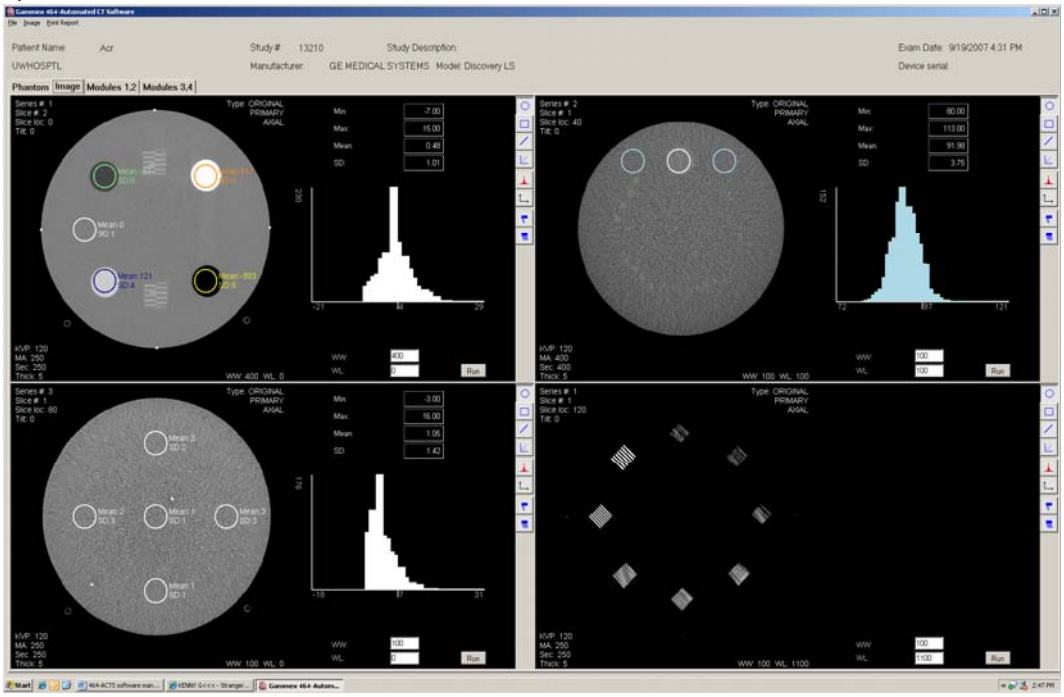
Activate the pull-down menu: Image-Run Automatic Tests to analyze the images.





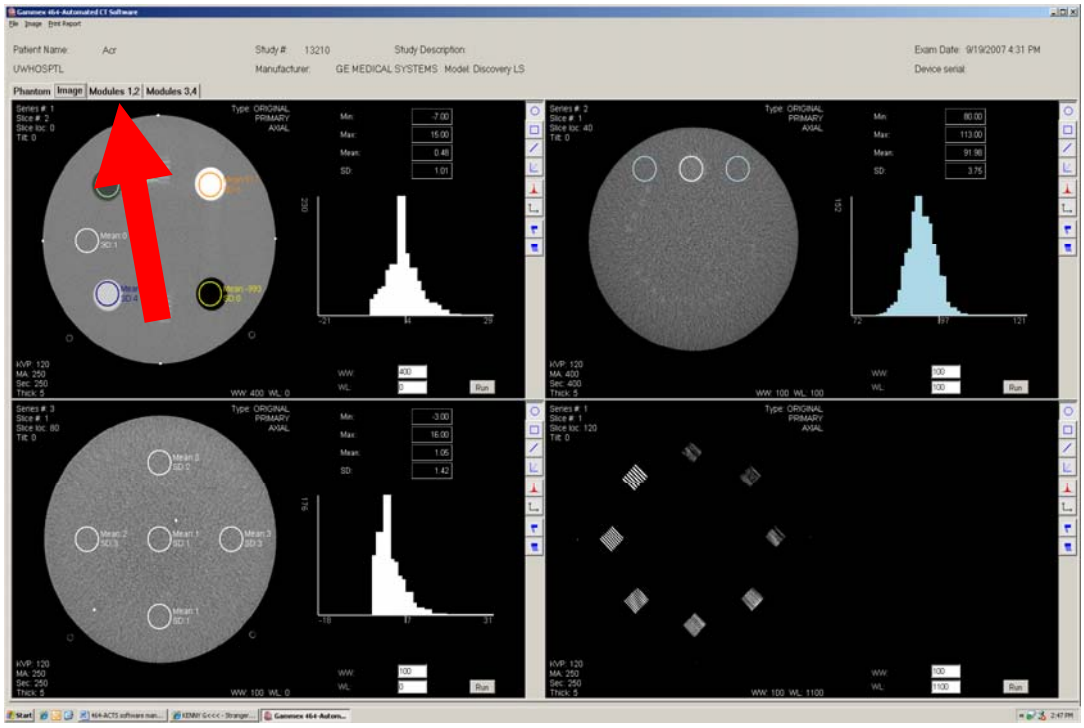
The results appear almost immediately (depending on your computer specifics).

The upper left quadrant shows the wire ramps used to measure slice thickness. It also shows the measured CT numbers for bone-mimicking material, water-mimicking material, acrylic, and air.



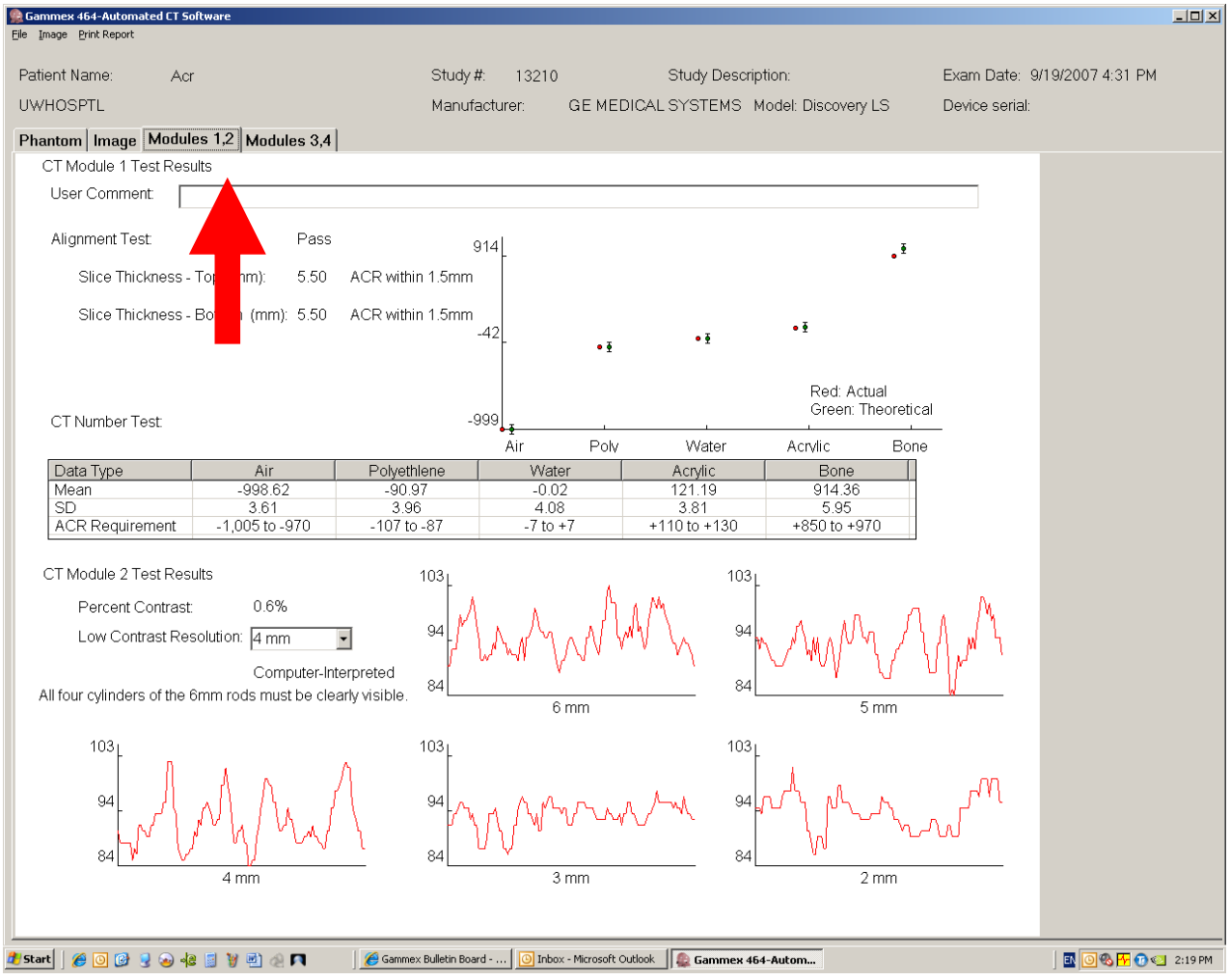
The upper right quadrant shows low contrast resolution test. And the lower left quadrant shows CT number uniformity and distance measurement accuracy. The lower right quadrant displays the high contrast resolution module.

These results are all available in report form on the next two screens. Click the "Modules 1, 2" tab for the first set of numbers:



Report Screen

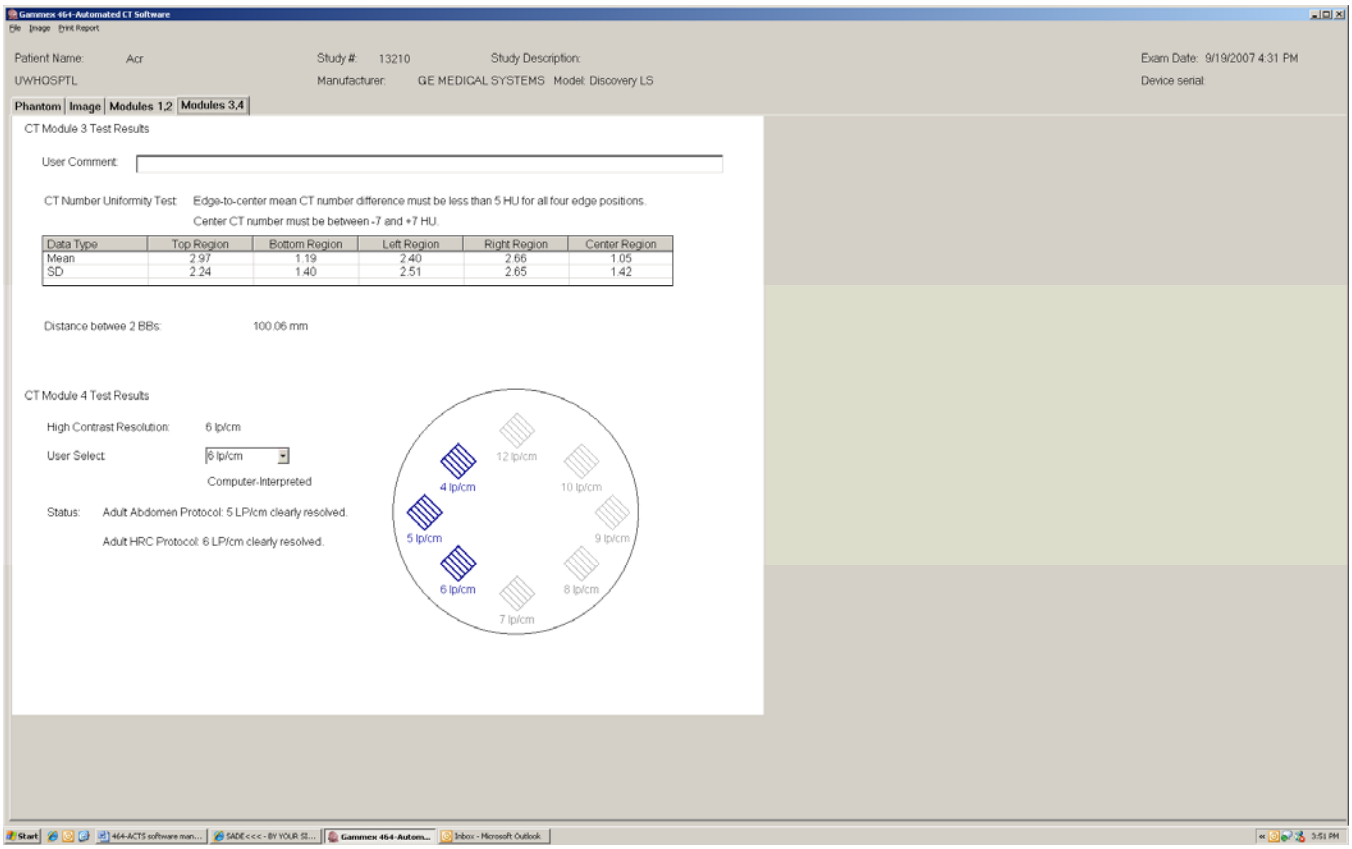
The ‘Module 1, 2’ tab shows the accuracy of CT numbers for Module1 consisting of a table of values and a graph of the same values. The alignment test refers to how well the phantom is aligned with the x-ray beam. Slice thickness results for both ramps are displayed below the alignment test. At the bottom of the screen there are results for Module 2 low contrast resolution. The graphs show pixel values for a line drawn through the center of each group of four cylinders.


Gammex 464-Automated CT Software
File Image Print Report
Patient Name: Acr
Study #: 13210
Study Description:
Exam Date: 9/19/2007 4:31 PM
UWHOSPTL
Manufacturer: GE MEDICAL SYSTEMS Model: Discovery LS
Device serial:
Phantom Image Modules 1,2 Modules 3,4
CT Module 1 Test Results
User Comment:
Alignment Test: Pass
Slice Thickness - Top (mm): 5.50 ACR within 1.5mm
Slice Thickness - Bottom (mm): 5.50 ACR within 1.5mm
CT Number Test:
914
-42
-999
Red: Actual
Green: Theoretical
Air Poly Water Acrylic Bone
Data Type | Air | Polyethlene | Water | Acrylic | Bone
Mean | -998.62 | -90.97 | -0.02 | 121.19 | 914.36
SD | 3.61 | 3.96 | 4.08 | 3.81 | 5.95
ACR Requirement | -1,005 to -970 | -107 to -87 | -7 to +7 | +110 to +130 | +850 to +970
CT Module 2 Test Results
Percent Contrast: 0.6%
Low Contrast Resolution: 4 mm
Computer-Interpreted
All four cylinders of the 6mm rods must be clearly visible.
103
94
84
6 mm
5 mm
4 mm
3 mm
2 mm
Start
Gammex Bulletin Board - ...
Inbox - Microsoft Outlook
Gammex 464-Autom...
2:19 PM

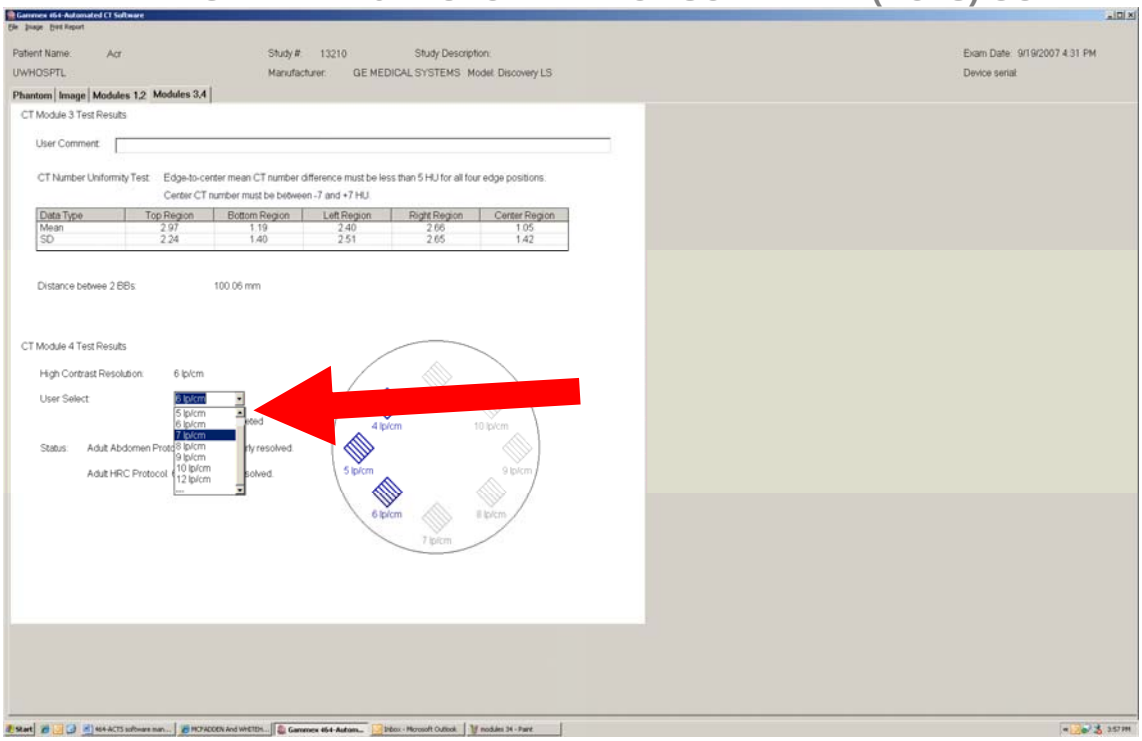
The contrast resolution represented on this screen is based on the computer's interpretation as indicated by a tag below the result. (as shown in the screen-shot below). **The human observer's perception should be the defining measurement.** To accommodate input by a human, the user may click on the low-contrast resolution drop-down box and select an alternate (what user sees) choice. Once this happens, the computer shows the data as "User-interpreted" rather than "computer interpreted." Once a user adds his/her interpretation, the computer interpretation can be found by re-running the test.

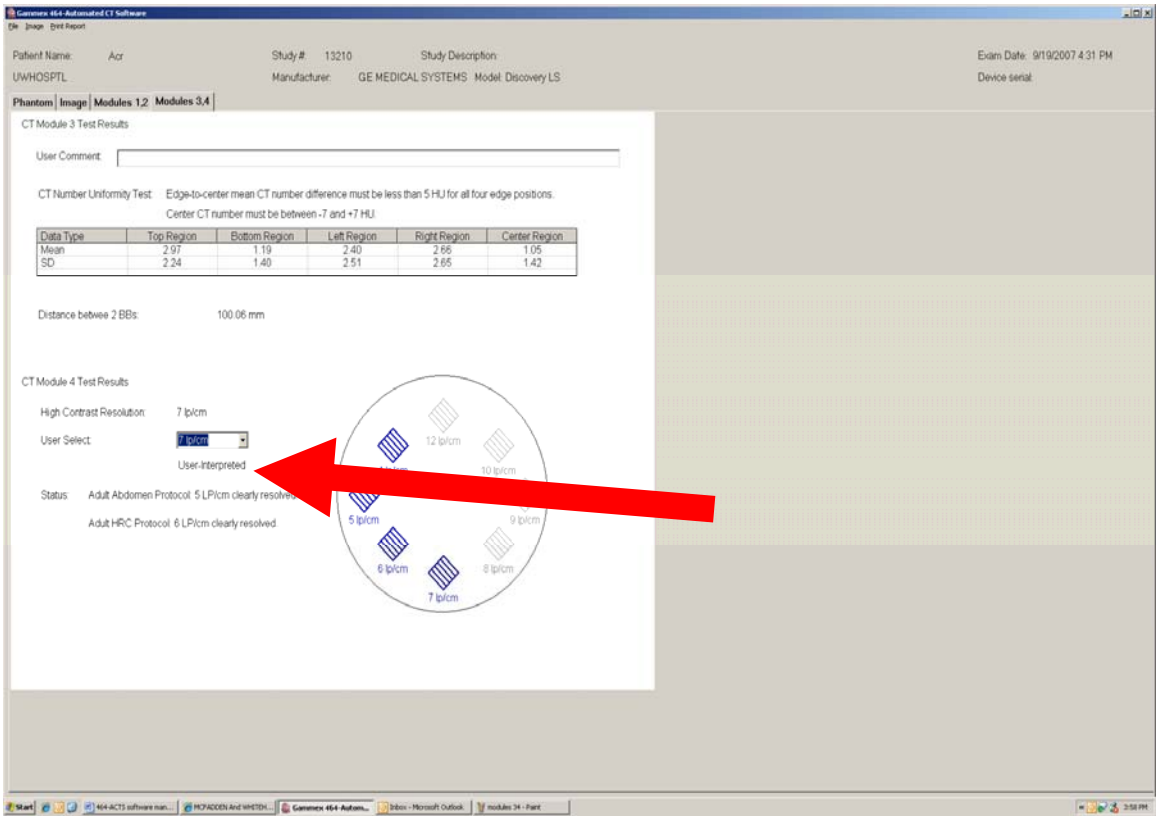
Gammex 464-Automated CT Software
File Image Print Report
Patient Name: Acr
Study #: 13210
Study Description:
Exam Date: 9/19/2007 4:31 PM
UWHOSPTL
Manufacturer: GE MEDICAL SYSTEMS Model: Discovery LS
Device serial:
Phantom Image Modules 1,2 Modules 3,4
CT Module 1 Test Results
User Comment:
Alignment Test: Pass
Slice Thickness - Top (mm): 5.50 ACR within 1.5mm
Slice Thickness - Bottom (mm): 5.50 ACR within 1.5mm
CT Number Test:
914
-42
-999
Red: Actual
Green: Theoretical
Air Poly Water Acrylic Bone
Data Type | Air | Polyethlene | Water | Acrylic | Bone
Mean | -998.62 | -90.97 | -0.02 | 121.19 | 914.36
SD | 3.61 | 3.96 | 4.08 | 3.81 | 5.95
ACR Requirement | -1,005 to -970 | -107 to -87 | -7 to +7 | +110 to +130 | +850 to +970
CT Module 2 Test Results
Percent Contrast: 0.6%
Low Contrast Resolution: 4 mm
Computer-Interpreted
All four cylinders of the 6mm rods must be clearly visible.
103
94
84
6 mm
5 mm
4 mm
3 mm
2 mm
Start
Gammex Bulletin Board - ...
Inbox - Microsoft Outlook
Gammex 464-Autom...
2:19 PM

From the 'Module 3, 4' tab we see the results for module 3 and 4 results. The CT number uniformity test reports the mean and standard deviation of the five areas. It also gives the measured distance between the two BBs on Module 3 and the high contrast resolution for Module 4. **The computer algorithm for limiting contrast is unlikely to exactly match the perception of a human observer, but it is interesting as a reference point. Human judgment is the final authority.**


Gammex 464-Automated CT Software
Patient Name: Acr
Study #: 13210
Study Description:
Exam Date: 9/19/2007 4:31 PM
UWHOSPTL
Manufacturer: GE MEDICAL SYSTEMS Model: Discovery LS
Device serial:
Phantom | Image | Modules 1,2 | Modules 3,4
CT Module 3 Test Results
User Comment:
CT Number Uniformity Test: Edge-to-center mean CT number difference must be less than 5 HU for all four edge positions.
Center CT number must be between -7 and +7 HU.
Data Type | Top Region | Bottom Region | Left Region | Right Region | Center Region
Mean | 2.97 | 1.19 | 2.40 | 2.66 | 1.05
SD | 2.24 | 1.40 | 2.51 | 2.65 | 1.42
Distance betwee 2 BBs: 100.06 mm
CT Module 4 Test Results
High Contrast Resolution: 6 lp/cm
User Select: 6 lp/cm
Computer-Interpreted
Status: Adult Abdomen Protocol: 5 LP/cm clearly resolved.
Adult HRC Protocol: 6 LP/cm clearly resolved.
12 lp/cm
4 lp/cm
10 lp/cm
5 lp/cm
9 lp/cm
6 lp/cm
8 lp/cm
7 lp/cm

On either results tab (Modules 1, 2 or Modules 3, 4), the user can either keep the computer-interpreted result or you can over-ride it. To over-ride it, simply click on the drop-down menu in the parameter field you wish to change (see next screen shot) and select the new value (note that the display of this parameter will automatically change to "User-interpreted" when you do this. The only way to return it to "computer-interpreted" is to close the application and re-run the test.

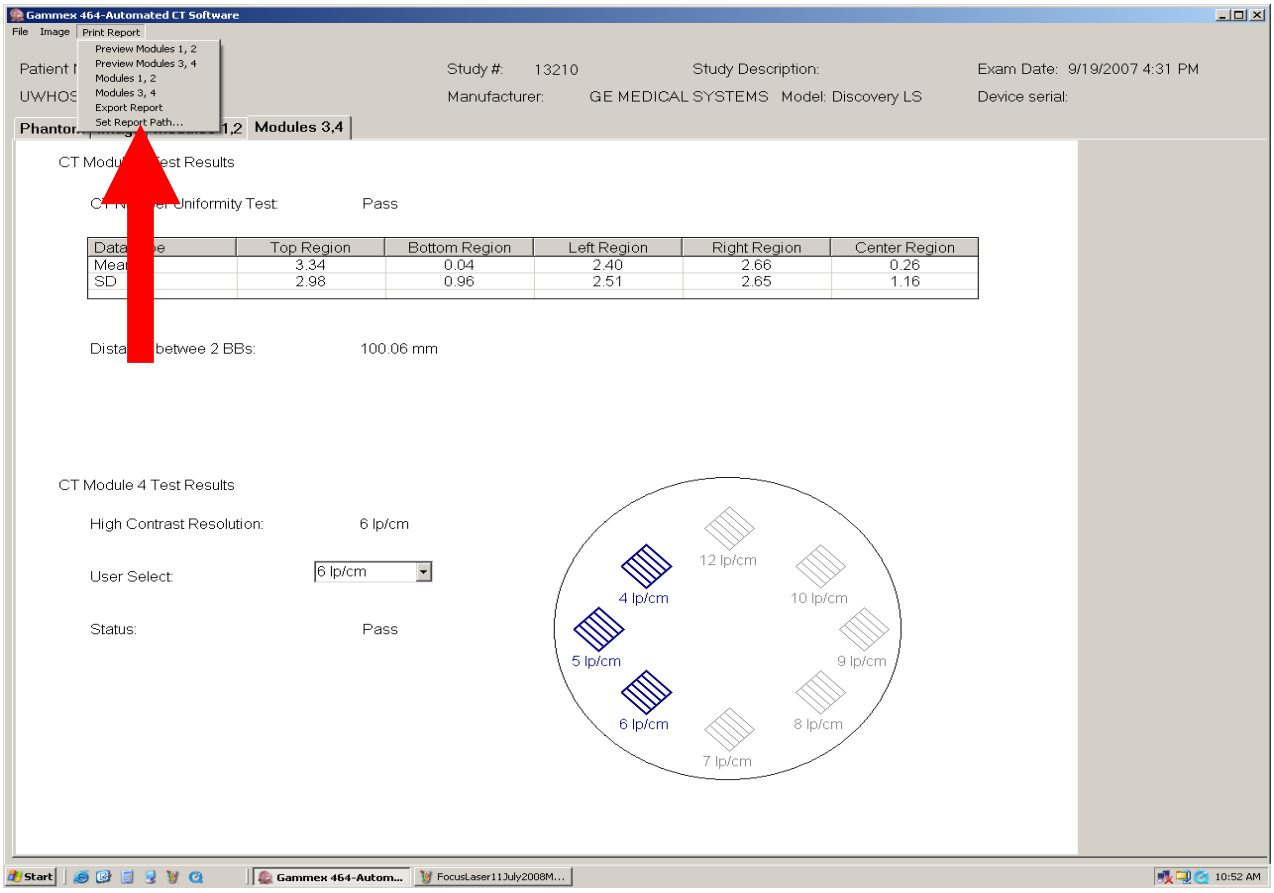

Gammex 464 Automated CT Software
Patient Name: Acr
Study #: 13210
Study Description:
Exam Date: 9/19/2007 4:31 PM
UWHOSPTL
Manufacturer: GE MEDICAL SYSTEMS Model: Discovery LS
Device serial:
Phantom | Image | Modules 1,2 | Modules 3,4
CT Module 3 Test Results
User Comment:
CT Number Uniformity Test: Edge-to-center mean CT number difference must be less than 5 HU for all four edge positions.
Center CT number must be between -7 and +7 HU.
Data Type | Top Region | Bottom Region | Left Region | Right Region | Center Region
Mean | 2.97 | 1.19 | 2.40 | 2.66 | 1.05
SD | 2.24 | 1.40 | 2.51 | 2.65 | 1.42
Distance betwee 2 BBs: 100.06 mm
CT Module 4 Test Results
High Contrast Resolution: 6 lp/cm
User Select: 6 lp/cm
5 lp/cm
6 lp/cm
7 lp/cm
8 lp/cm
9 lp/cm
10 lp/cm
12 lp/cm
Status: Adult Abdomen Protocol
Adult HRC Protocol
4 lp/cm
5 lp/cm
6 lp/cm
7 lp/cm
8 lp/cm
9 lp/cm
10 lp/cm


Gammex 464 Automated CT Software
Patient Name: Acr
Study #: 13210
Study Description:
Exam Date: 9/19/2007 4:31 PM
UWHOSPTL
Manufacturer: GE MEDICAL SYSTEMS Model: Discovery LS
Device serial:
Phantom | Image | Modules 1,2 | Modules 3,4
CT Module 3 Test Results
User Comment:
CT Number Uniformity Test: Edge-to-center mean CT number difference must be less than 5 HU for all four edge positions.
Center CT number must be between -7 and +7 HU.
Data Type | Top Region | Bottom Region | Left Region | Right Region | Center Region
Mean | 2.97 | 1.19 | 2.40 | 2.66 | 1.05
SD | 2.24 | 1.40 | 2.51 | 2.65 | 1.42
Distance betwee 2 BBs: 100.06 mm
CT Module 4 Test Results
High Contrast Resolution: 7 lp/cm
User Select: 7 lp/cm
User-Interpreted
Status: Adult Abdomen Protocol: 5 LP/cm clearly resolved
Adult HRC Protocol: 6 LP/cm clearly resolved
5 lp/cm
6 lp/cm
7 lp/cm
8 lp/cm
9 lp/cm
10 lp/cm
12 lp/cm

5. Data Export

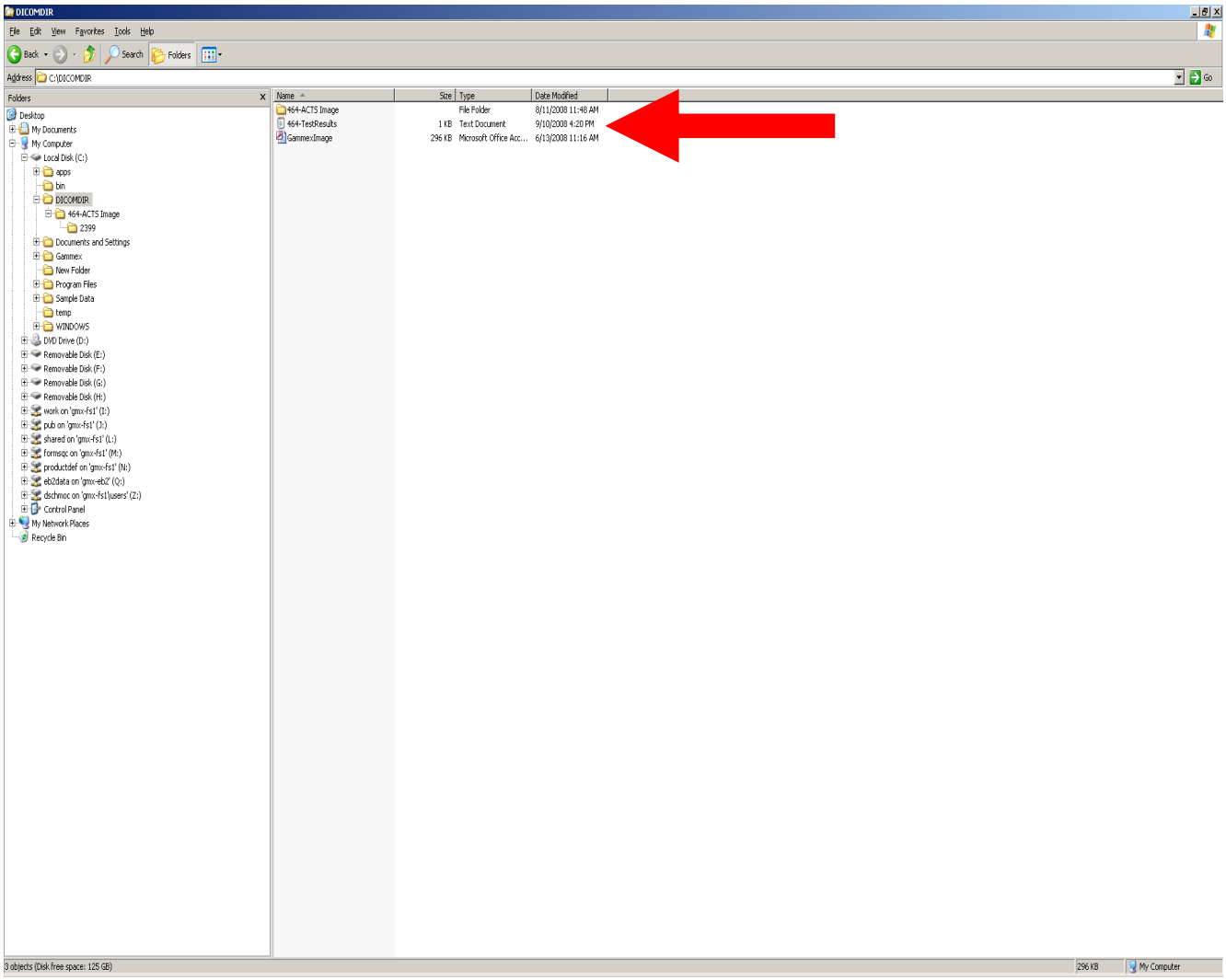
All of these results can be saved and printed, and/or exported to a spreadsheet application of your choice. To export the data, click on “Print Report" at the top of the screen on the menu bar. When the menu drops down, choose "Export Report", and it will write the data into a file called, "464-TestResults.txt" in the C:\DICIMDIR\ directory. Repeated data exports result in the new (latest) data being appended to the same file (C:\DICOMDIR\464-TestResults.txt.). If the user has input (added) text into the User input text box (such as a label for your test parameters), this will also be exported to your .txt text file. Some manual editing may be required as you process your .txt file data as a result of the text added as “User Input.”

Rename the file or move it to a different directory if you want to save it. The data is formatted as text with tab delimiters, so it is easy to import this file “464-TestResults.txt” into a spread sheet for further manipulation.



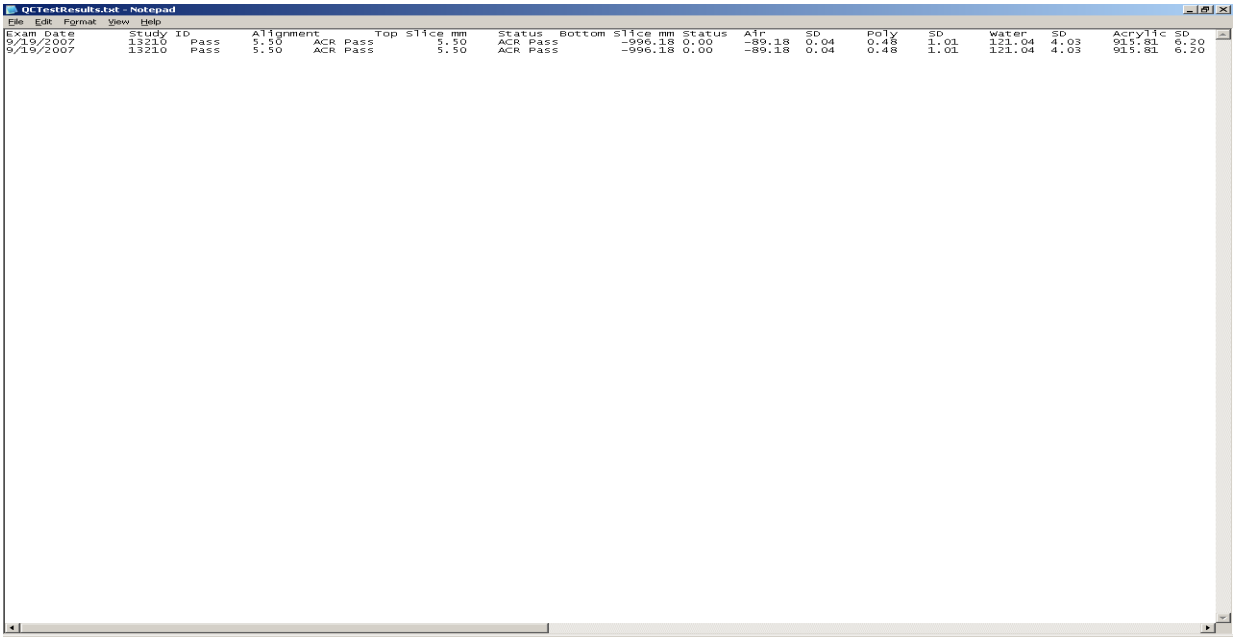
To print the results, click on "Modules 1, 2" tab or "Modules 3, 4" tab and then use the Print pull-down menu.

The export file "C:\DICOMDIR\464-TestResults.txt" is located with the Windows explorer:



5. Data Export (continued)

The text file looks like this. Columns are separated by tabs.



QCTestResults.txt - Notepad

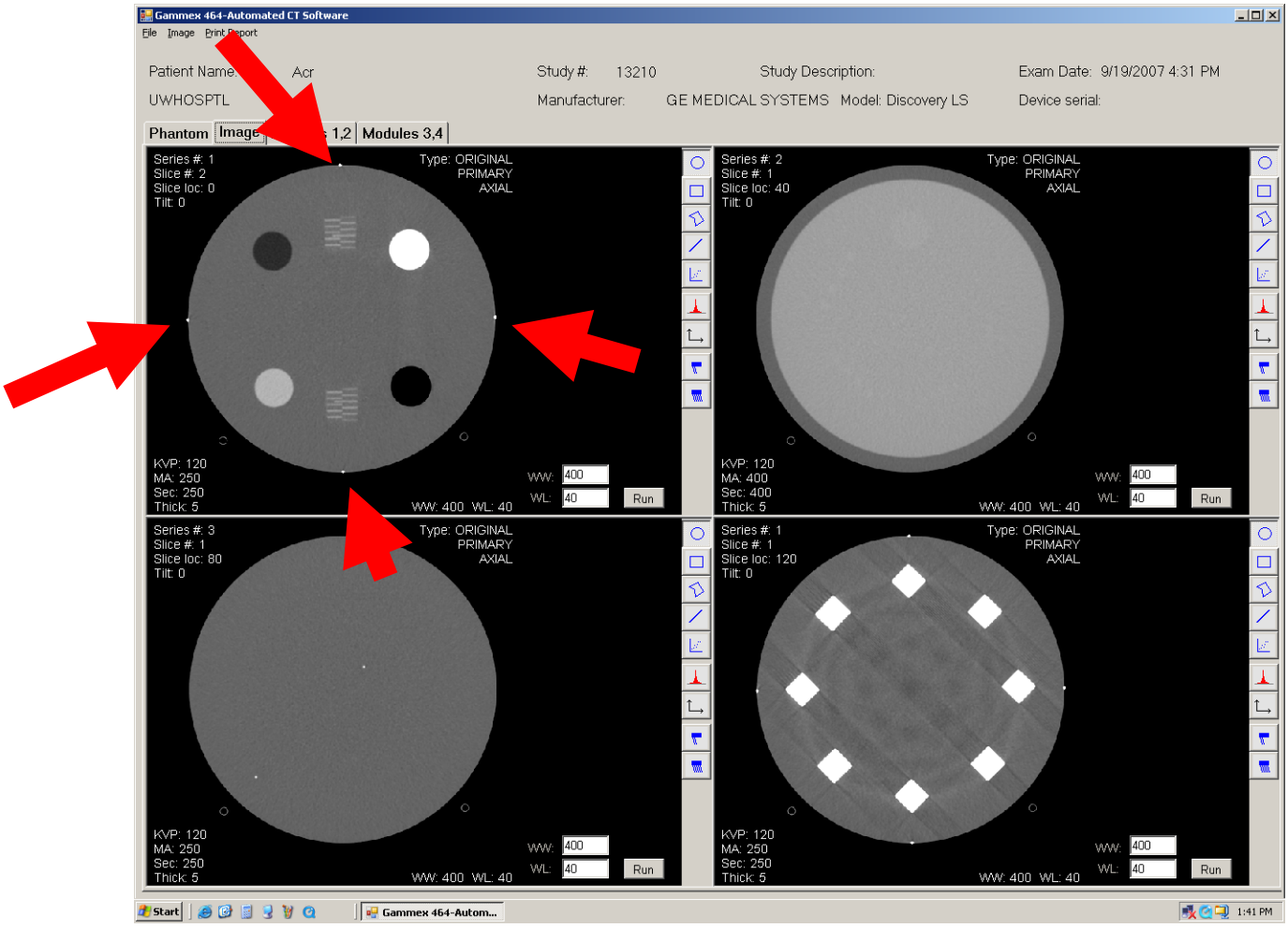
File Edit Format View Help

Exam Date	Study ID		Alignment		Top Slice mm	Status	Bottom Slice mm	Status	Air	SD	Poly	SD	Water	SD	Acrylic	SD
9/19/2007	13210	Pass	5.50	ACR Pass	5.50	ACR Pass	-996.18	0.00	-89.18	0.04	0.48	1.01	121.04	4.03	915.81	6.20
9/19/2007	13210	Pass	5.50	ACR Pass	5.50	ACR Pass	-996.18	0.00	-89.18	0.04	0.48	1.01	121.04	4.03	915.81	6.20

Your favorite spreadsheet application may now be used to import this text data for printing, sorting, reporting, or other functions as desired.

6. Advanced Topics

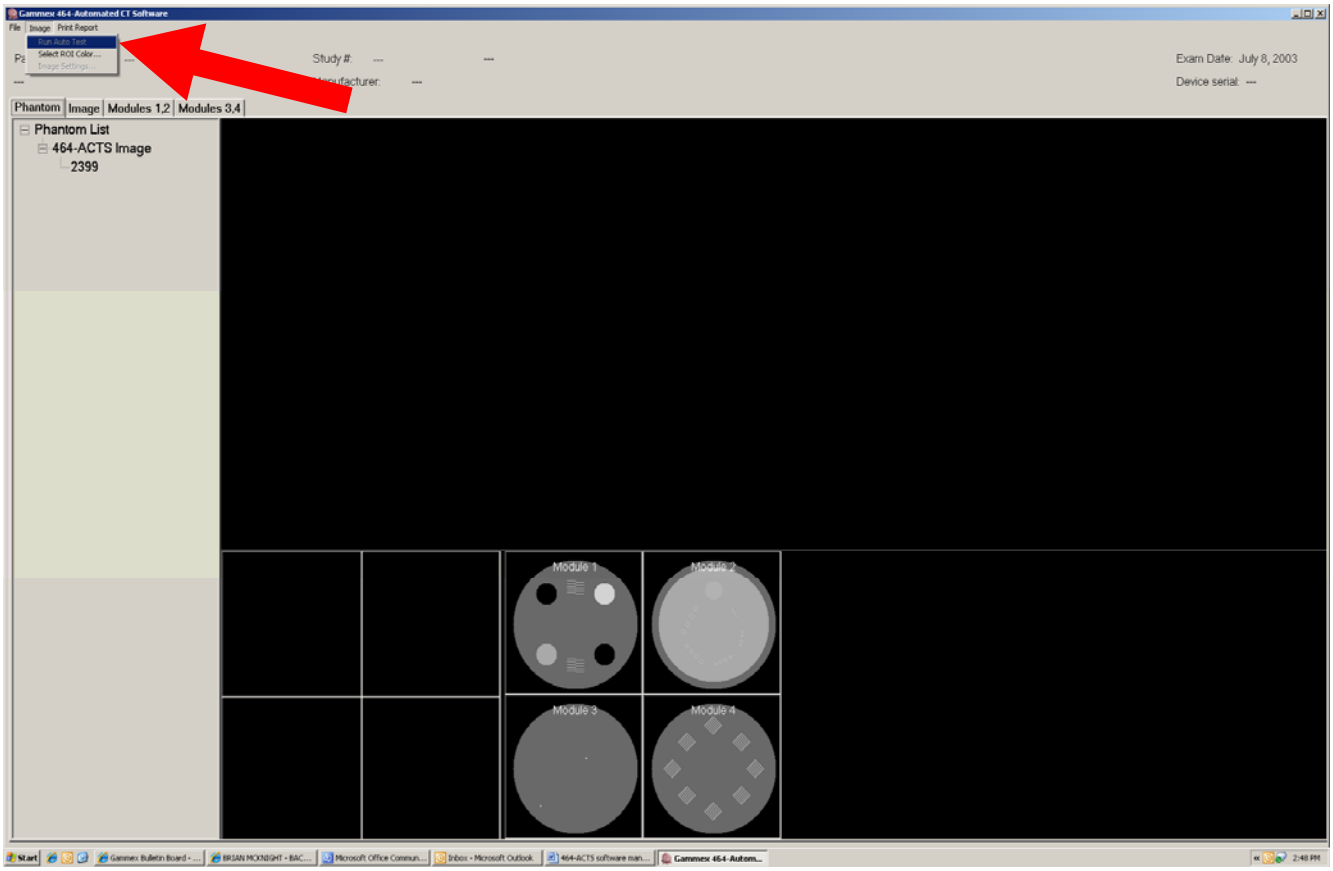
Main screen display (module 1) should show visible display of all four BBs. (see below)



This is described in "Site Scanning instructions for Use of the CT Phantom for the ACR Computed Tomography Accreditation Program."

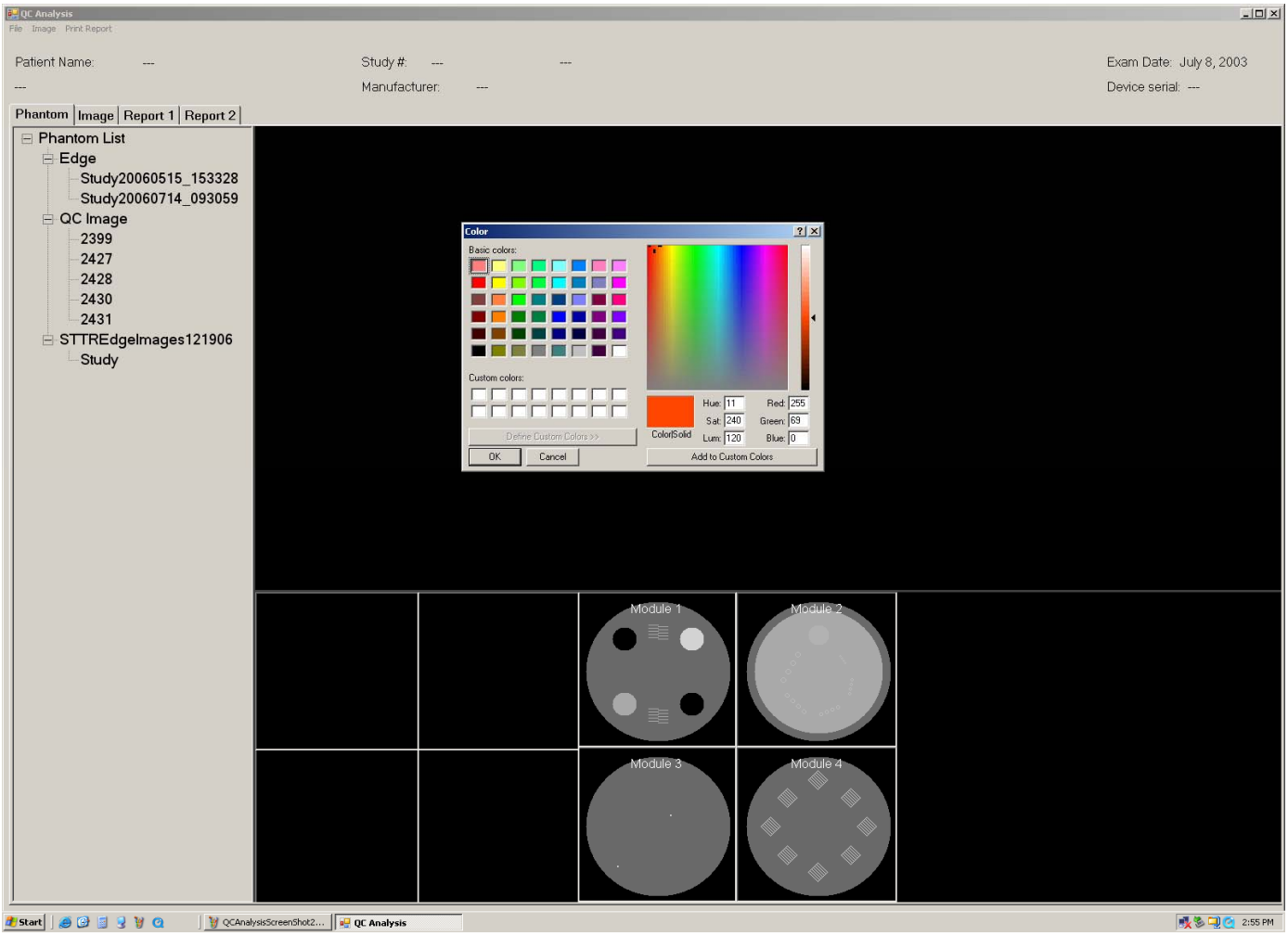
6. Advanced Topics (continued)

From the “image” pull-down menu, three options appear. "Run Auto Test" is grayed out until the module 1-4 images placed into the four quadrants (lower left section of black part of screen) and you then navigate to the ‘Image’ tab. To remedy, open a study such as 2399 and place the images in their correct quadrants and then proceed to the image tab to Run Auto Test.



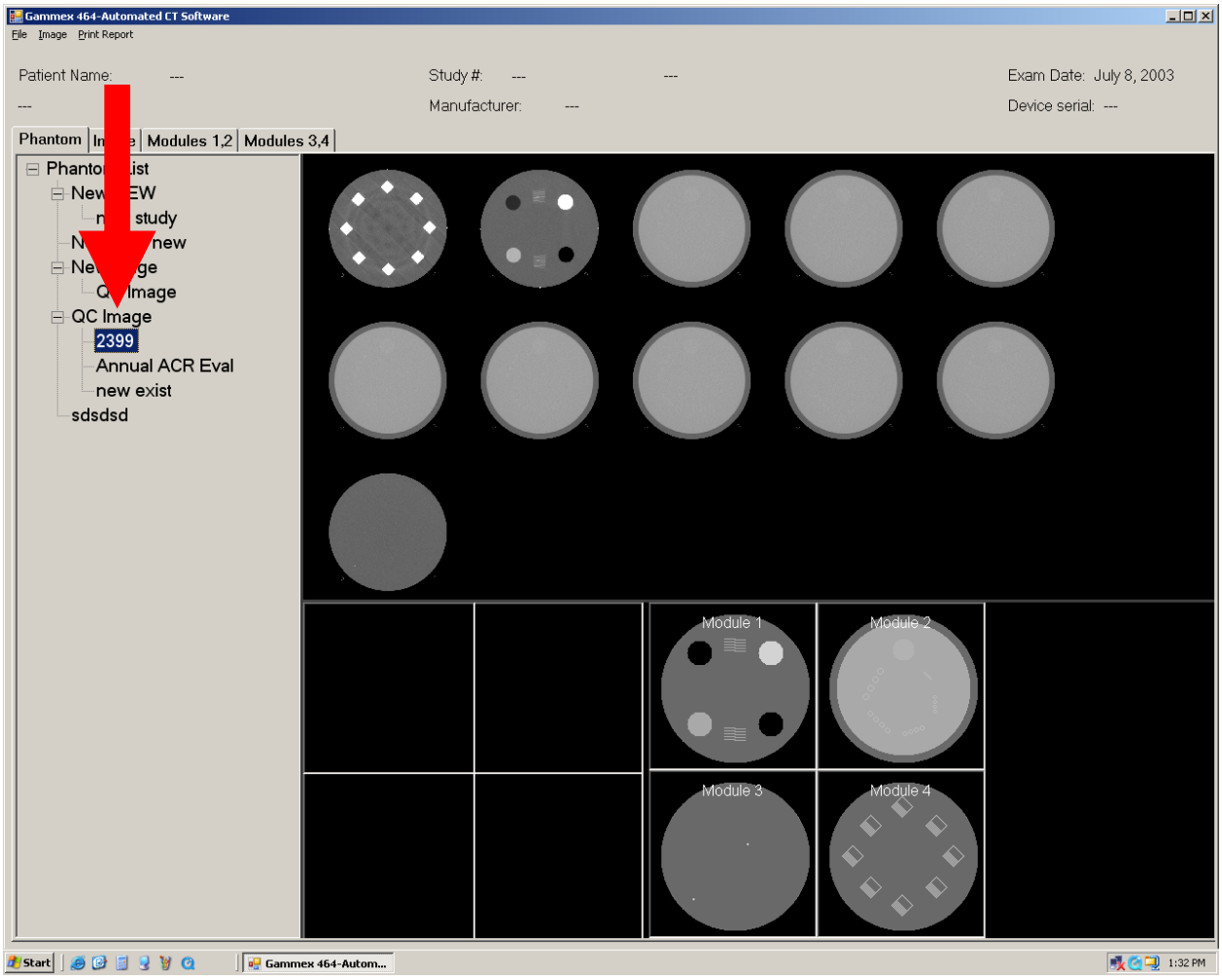
6. Advanced Topics (continued)

Also available from this “image” pull-down menu is the "Select ROI Color" choice which brings up a palette to assign new colors to the "Image" screen if desired.

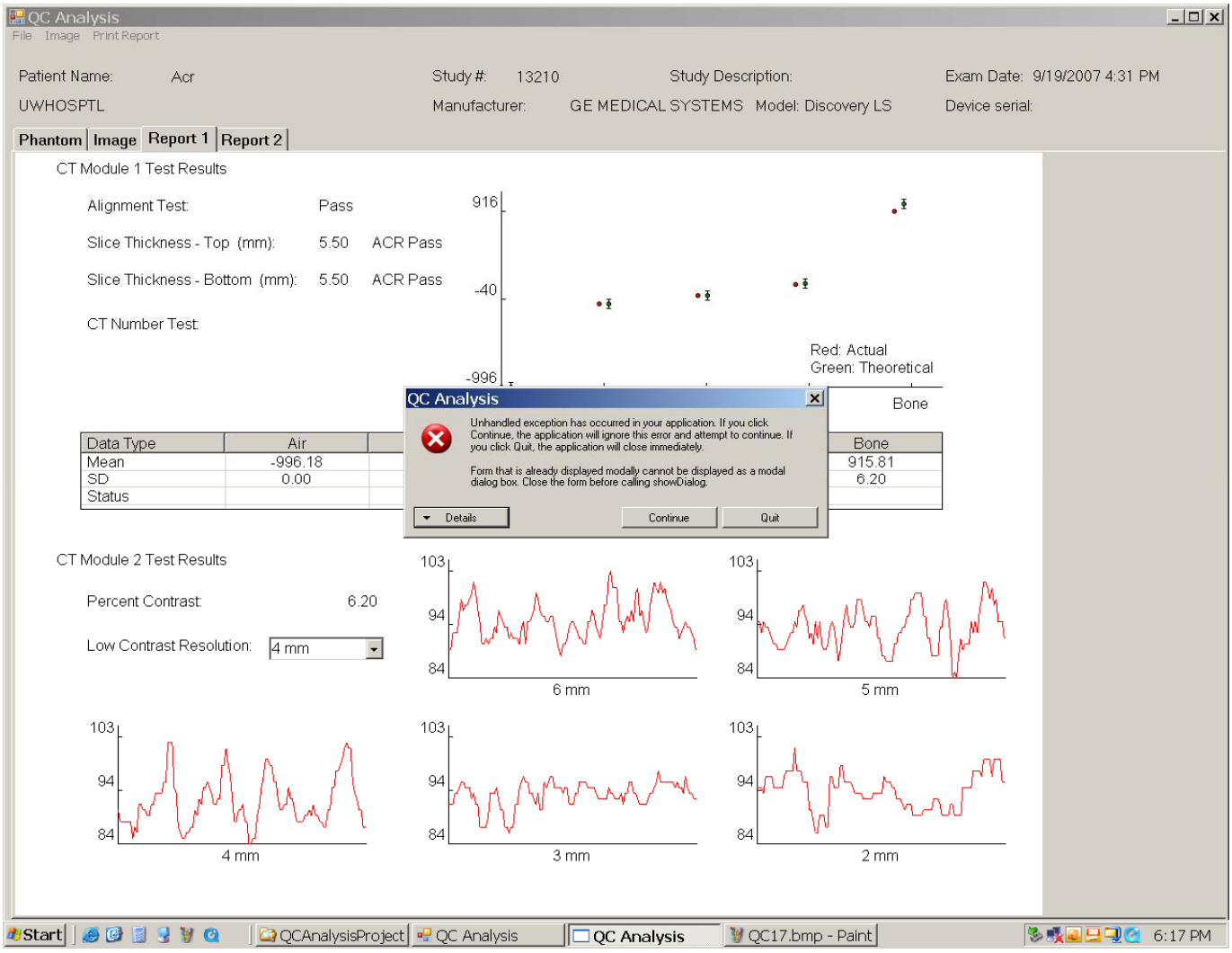


6. Advanced Topics (continued)

All of the files and subdirectories in the left hand column are located in "C:\DICOMDIR\" on the C: drive.



6. Advanced Topics (continued)

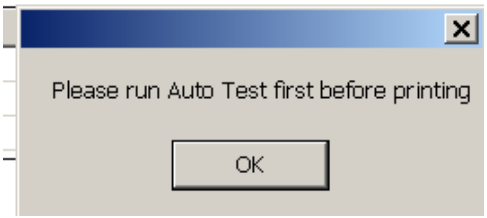


If, during the course of running the 464-ACTS you receive the above “unhandled exception error,” please select either Continue or Quit. Close 464-ACTS and start it again.

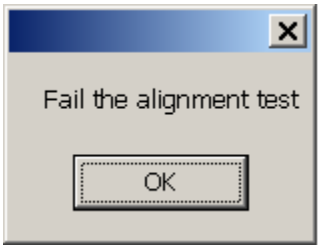
If you continue to receive this message, it may be necessary to reboot the computer (after first saving any files or work you don’t want to lose during reboot process).

7. Troubleshooting

This error message results from trying to print before running the automatic test “Run Auto Test.” Click "OK" and then select the "Image" pull-down menu to "Run Auto Test." If "Run Auto Test" is grayed out, click on the "Image" tab, then "Image" (pull-down menu) to "Run Auto Test".

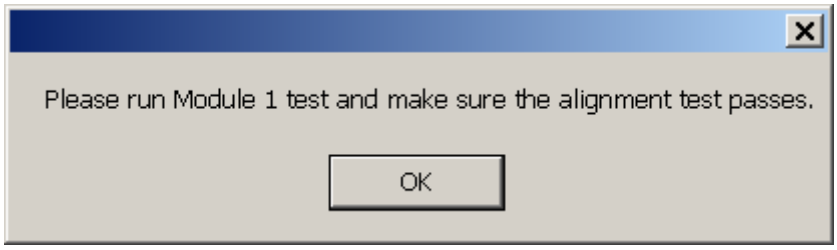


If you get an error message like this:



It is probably because of unsatisfactory alignment in module 1. Click the "OK" button.

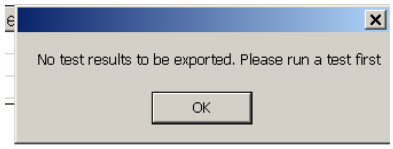
You should then see this message:



Click "OK" and return to the "Image" screen by clicking the "Image" tab.

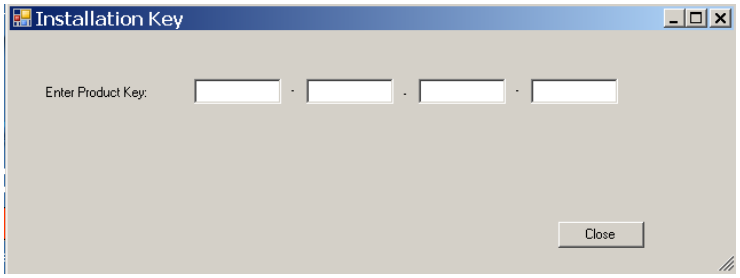
7. Troubleshooting (continued)

If you have not yet run any test to provide data to export and you attempt to export data (which is not yet computed), then you will see this (below) error message:



Just run a test and then try exporting data again. Once proper data export occurs, you should see this (below):

During installation, working from the letter than came with your 464-ACTS CD, locate the sixteen-digit product key. Type the numbers into the boxes starting with cursor in the first (left-most) white box (input field). Do not type any dashes or spaces. The cursor will automatically follow to the next box after you've typed four numbers into the current box.



If the result is this dialog box, then the key entered is not the one the computer thinks you should have. Be sure to type the number without spaces or dashes. Check the letter you received with your user manual. The key input should be sixteen digits typed with no letters or punctuation marks.

8. Technical Support

Technical support is available from Gammex Service Representatives who are available to work with facility planners, architects and hospital personnel throughout the planning and installation process. Contact the Gammex Service department: 608-828-7000
TOLL FREE (U.S. and Canada only): 800-232-9699
FAX: 608-831-0964
Service e-mail: support@gammex.com

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